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***The 1984 Fire Season,
Northwest Resource Area***

by Melanie Miller
and Scott Robinson



Bureau of Land Management
Alaska

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THE 1984 FIRE SEASON, NORTHWEST RESOURCE AREA, BLM, ALASKA

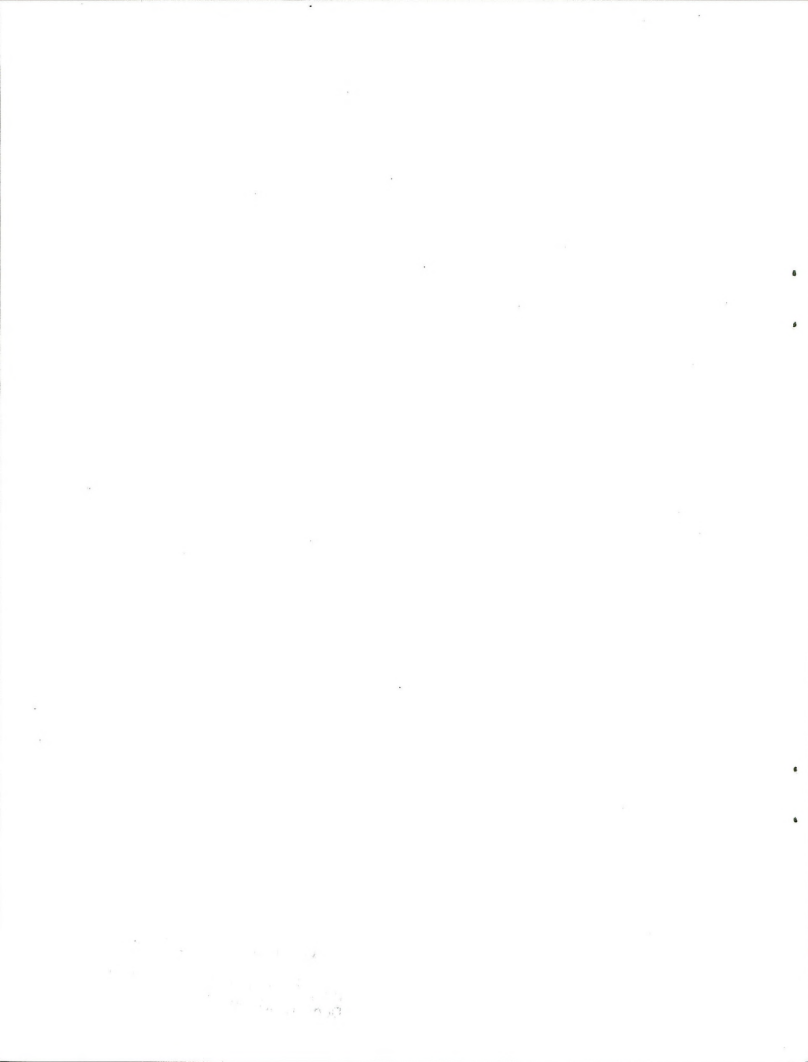
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The 1984 Fire Season, Northwest Resource Area, BLM, Alaska

Scott R. Robinson and Melanie Miller*

INTRODUCTION

Fire has occurred within Alaska for thousands of years. Without it, plant succession advances to a stage with lower productivity. Although some wildlife species, such as the red squirrel, prefer climax boreal forests, far more species, such as moose, prefer early to mid-seral stages. Periodic fires will establish habitats with varied age structure, thus, providing food, cover, and edge effect requirements for all native wildlife.

Beginning in the mid 1900's, active fire suppression has gained momentum to become a limiting factor in many present day wildlife populations. From 1900 to 1940, approximately 60 to 100 million acres burned (Viereck 1973). During the next 40 years, the basic management policy was to aggressively suppress all fires, which resulted in approximately 30 million acres burned (Gabriel and Tande 1983). Due to its size and mobility, the fire suppression organization has become quite efficient in reducing the total acreage burned over long periods of time. Reversing this trend will be mandatory in order to help some wildlife populations regain their former status.

The Alaska Interagency Fire Management Plan (AIFMP) is an attempt to reverse this trend in addition to its main purpose of reducing fire suppression costs. This plan has the approval and support of the Alaska Land Use Council that was created by the Alaska National Interest Lands Conservation Act (ANILCA). Alaska is currently divided into thirteen planning areas; the Northwest Resource Area (NWRRA) contains portions of the Kuskokwim-Iliamna, Kobuk, Seward-Koyukuk, Tanana-Minchumina, Upper Yukon-Tanana, and Yukon-Togiak areas. Within these planning areas, land managers and owners are able to select one of four fire management options: Critical Protection, Full Protection, Modified Action, and Limited Action. (Options are outlined in Appendix A.) This selection process allows land managers to designate the level of fire suppression needed for their lands, ranging from full and sustained attack to monitoring only. It also sets priorities for the fire suppression organizations for initial attack actions during fire-bust situations (Taylor et al 1983).

The AIFMP was first implemented for the Tanana-Minchumina area during the 1982 fire season, for the Kuskokwim-Iliamna area in 1983, and the remaining planning areas during the 1984 fire season. A small amount of BLM land in the Northwest Resource Area selected by Doyon, Inc. was unplanned for part of the 1984 season because Doyon did not sign the Seward-Koyukuk plan until July 16. Although resource specialists identified the fire management options for their lands, the Bureau of Land Management's (BLM) Alaska Fire Service (AFS) is responsible for all operational aspects of the plan within the NWRRA. This report is an evaluation of the fire plan's implementation during the 1984 fire season.

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OBJECTIVES

Objectives of this report are: (1) to document the chronology of fire occurrence during the 1984 fire season, (2) to document geographic distribution of fires within the NWRA, and (3) to document any cost savings as a result of implementing the fire plan.

STUDY AREA

The NWRA is bounded on the east by the Trans-Alaska Pipeline Corridor, on the south by the 64th parallel, on the west by the Bering Sea, and on the north by the Brooks Range. The entire NWRA has been thoroughly described in the Central Yukon Resource Management Plan, the Northwest Unit Resource Analysis, or planning documents for each of the planning areas of the AIFMP. The eastern half is drained by the Yukon River and its tributaries, while the western half drains directly to the coast. Elevation varies from sea level to 400 feet along the Yukon River, 2,000 to 4,000 feet for the gently rolling hills, and 5,000 to 10,000 feet for the rugged mountains. Vegetation varies from coastal wetlands to conifer and hardwood forests that are typical of interior Alaska and alpine tundra. Black and brown bear, caribou, moose, furbearers, game birds, raptors, waterfowl, and a host of other wildlife species inhabit the NWRA.

The resource area is further subdivided into subunits for purposes of land-use planning. Subunits for the Central Yukon Plan are the Brooks, Dulbi-Kaiyuh, Kuskokwim, Hughes, Nenana, E. Nulato, and Tozitna. Subunits within the Northwest Planning Area are the Bendeleben, Buckland, Imuruk, W. Nulato, Sheklukshuk, and Squirrel-Noatak (Figure 1). Some of the fire statistics have been summarized for all BLM lands within these subunits to provide a geographical reference, and to allow comparison with fire occurrence summaries in other documents (Miller 1985; BLM, Northwest Resource Area, 1983).

METHODS

Analysis is based upon all of the "Individual Fire Reports" (DI-1201) and BLM computer files for suppression costs. The location of all fires on BLM administered lands (including selected lands) within the NWRA are listed in Appendix B.

The number of fire starts were listed by calendar date for each subunit. Cumulative number and percent of starts were then calculated. From these summaries, the date of 60, 70, 80, and 90 percent of fires that had started were identified. The dates of the earliest and latest fire starts were also identified for each subunit.

The number of fire starts, number of burned acres, and total suppression costs in 1984 dollars were summarized by planning subunit by management option.

All fire starts were listed by management option. Fire sizes at the time of detection and when declared out were noted. Dates at the time of detection, attack, control, and when declared out were identified. Total fire fighting

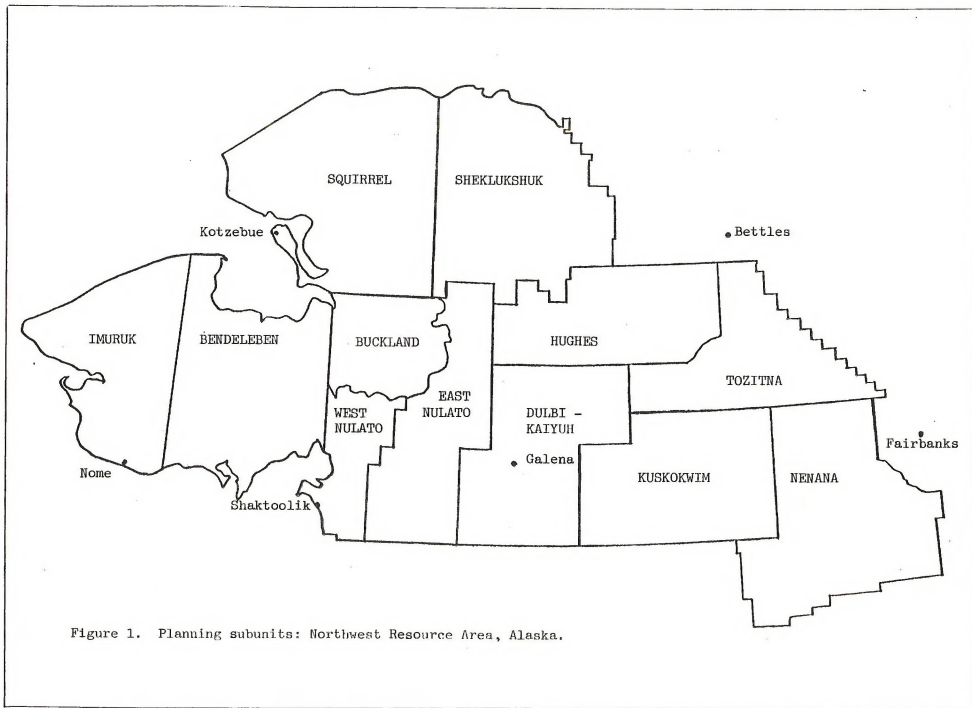


Figure 1. Planning subunits: Northwest Resource Area, Alaska.

forces including gallons of retardant and assistance from rain showers were listed. Total suppression costs in 1984 dollars were also listed for each management option.

RESULTS AND DISCUSSION

Overview of Fire Season

During the 1984 fire season, 141 fire numbers were assigned to all BLM lands within Alaska (Alaska Fire Service 1984). Of this total, 84 fire numbers (60%) were assigned within the NWRA (Appendix B). Thirteen of these were false alarms, 68 were managed according to fire management options described within the AIFMP, and three were suppressed according to the Alaska Fire Attack Policy. Of the 20,997 acres burned on BLM lands within the State, 14,422 acres (69%) were within the NWRA. Fire management in the NWRA is a significant portion of the statewide BLM program.

The 1984 fire season in the NWRA lasted for five weeks, with 71 fires, all lightning caused, detected from June 9 through July 13 (Table 1). One man-caused fire started on September 24, near Galena. Eight days had three or more fire starts, with the maximum number of starts, 12, occurring on June 24 and July 2. Ten fires started on June 25 and eight on June 26. Four days thus accounted for 59% of the total number of fires. Before June 19, fires were found only in the Hughes and Sheklukshuk subunits. During the 12 day period June 24 through July 4, 56 fires (79% of the total) were distributed among all subunits. All fire activity in the Seward Peninsula and western Nulato Hills was restricted to the period June 24 through July 2. A rainy period which began on the fourth of July essentially ended the fire season, with only two starts occurring after that date.

Distribution and Size

Far more fires occurred within the Central Yukon Planning Area than in the Northwest Planning Area (Table 2). Only one fire began on the western Seward Peninsula. Three occurred west of the Darby Mountains, two in the Buckland Basin, three near Koyuk, and three near Noatak. Although technically in the Northwest Planning Area, the Sheklukshuk subunit is more closely related geographically to the Hughes subunit. The greatest numbers of fires occurred in the Hughes, Sheklukshuk, and Tozitna subunits, with 15, 10, and 13 starts accordingly. There were three concentrations of fires in the Resource Area: nine fires in the Sheklukshuk subunit between the Kobuk and Selawik Rivers; nine fires in the Hughes block between the Koyukuk River and the Pah River Flats; and eight fires in the Tozitna River basin.

Of the 71 fires which did occur, nine were less than one acre, 32 were one to ten acres, 15 ranged from ten to 100 acres, four were between 100 and 300 acres, five were from 300 to 1,000 acres, and six fires were greater than 1,000 acres. Fires larger than 100 acres occurred in seven of the 12 subunits. The greatest amount of burned acreage was in the Sheklukshuk subunit with 5,811 acres (Table 2). There were 2,629 burned acres in the Hughes subunit, 1,869 acres in the Kuskokwim, 1,774 acres in the Tozitna, and 1,153 acres

TABLE 2. FIRE OCCURRENCE AND COST BY MANAGEMENT OPTION
BLM LAND: NORTHWEST RESOURCE AREA
1984 FIRE SEASON

SUBUNIT	NUMBER OF FIRE STARTS			NUMBER OF BURNED ACRES				TOTAL SUPPRESSION COSTS (\$84)				
	FULL	MODIFIED	LIMITED	TOTAL	FULL	MODIFIED	LIMITED	TOTAL	FULL	MODIFIED	LIMITED	TOTAL
<u>Central Yukon</u>												
Dulbi-Kaliyuh	4	0	1	5	62.0	0.0	600.0	662.0	22,473	0	43	22,516
Kuskokwim	1	1	3	5	40.0	4.0	1,825.5	1,869.5	30,169	14,516	2,458	47,143
Hughes	2	9	3	14	800.1	528.4	1,300.5	2,629.0	105,577	117,183	2,355	225,115
Nenana	0	2	0	2	0.0	3.5	0.0	3.5	0	13,169	0	13,169
E. Nulato	1	2	2	5	15.0	15.0	6.0	36.0	42,698	50,179	0	92,877
Tozitna	3	0	7	10	3.0	0.0	1,771.0	1,774.0	13,854	0	4,209	18,063
<u>Northwest</u>												
Bendeleben	1	2	0	3	120.0	1,033.0	0.0	1,153.0	4,730	70,505	0	75,235
Buckland	0	0	2	2	0.0	0.0	385.0	385.0	0	0	128	128
Imuruk	1	0	0	1	20.0	0.0	0.0	20.0	6,048	0	0	6,048
W. Nulato	4	1	0	5	65.0	2.0	0.0	67.0	67,676	1,938	0	69,614
Sheklukshuk	0	8	5	13	0.0	450.6	5,361.0	5,811.6	0	72,819	3,888	76,707
Squirrel	3	0	0	3	11.0	0.0	0.0	11.0	5,353	0	0	5,353
<u>Total</u>	20	25	23	68	1,136.1	2,036.5	11,249.0	14,421.6	298,578	340,309	13,081	651,968
<u>Average</u>					56.8	81.5	489.1	209.0	14,929	13,612	569	9,588

NOTE: 3 unplanned fires are not included in this data set.

in the Bendeleben subunit. The Imuruk, Squirrel, and Nenana subunits had the least burned acreage, with 20, 11, and 3.5 acres (Table 1).

As should be expected, fire suppression did have a significant effect on the size class distribution of fires. Fire conditions and prompt initial attack allowed suppression of most fires at a small size. Only five of 44 fires (11%) receiving suppression action exceeded 100 acres in size, two in Full Protection areas, and three in Modified Action areas. Two fires in Modified Action areas went out at less than ten acres without suppression action. However, 10 of 23 fires (43%) in Limited Action areas were 100 acres or larger.

Large Fire Occurrence

Six fires were greater than 1,000 acres (Class F), although no Class G fires (greater than 5,000 acres) occurred. One fire was in a Modified Action area and the other five were in Limited Action areas. One Class F Limited Action fire occurred in the Hughes subunit, one in the Tozitna subunit, one in the Kuskokwim, and two in the Sheklukshuk. Considering that no suppression action was taken on these Limited fires, it is noteworthy that the largest only grew to 2,560 acres.

Fire A373 was a Modified Action fire on the west slope of the Darby Mountains. It was 100 acres upon detection on July 2; 500 acres when attacked later that same day; and an estimated 1,000 acres when contained and controlled on July 4.

Fire A109 was detected on June 17; seven surveillance flights were made by detection aircraft to monitor its status. The fire was about five miles west of the Hogatza River. First detected on June 17, it was 80 acres on June 18, and 600 acres early on June 21. It grew 700 additional acres by 1700 hours on June 21. No further increase in size occurred before the fire was declared out on June 29. A109 burned 1,300 acres total in "mixed tundra, spruce, and hardwood."

Fire A134 burned north of the junction of the Tozitna River and Twilight Creek in the eastern uplands of the Tozitna River basin. The fire was first noted as eight acres burning in tundra and spruce on June 19. Seventeen subsequent flights by detection aircraft monitored its growth. It was estimated at 1,200 acres on June 21, remapped at 900 acres on June 24, and grew to its final size of 1,200 acres on June 25. Further growth was precluded by rain. A134 was declared out on July 12.

Fire A201 occurred on the border between the Nowitna National Wildlife Refuge and BLM lands in the northwest part of the Kuskokwim subunit. Detected on June 23, the fire was burning in "black spruce and tundra". Its subsequent growth was monitored by 11 detection flights and one flight by the Merlin, using infrared equipment. A201 grew to 480 acres by June 26. On June 28, it reached its final size of 2,200 acres, held on the north, west, and south sides by forks of the Big Mud River. Hot spots were located on July 3 and 4. A general rain starting on July 5 extinguished the fire, except for one smoke seen on the northeast corner on July 13. It was declared out on July 24.

Fire A225 burned in the Sheklukshuk Range and was monitored by six detection flights. The fire ranged over broken topography in tussock tundra with patches of hardwood trees on south facing slopes. Detected as a spot on June 24, this fire was declared out on June 29 after an assessment made with aerial infrared equipment. However, it "flared back up" on June 30, reached 1,300 acres by July 2, and 1900 acres by July 3. A225 reached its final size of 2,560 acres by July 4 when general rain developed. When flown by M. Miller on the 4th of July, permafrost melting was apparent on areas of the fire on which part of the organic layer had been removed. Vegetative regrowth was observed in a similar habitat within ten days of burning on a fire about 25 miles to the southeast.

Fire A413 was discovered at about 1700 hours on July 3, burning on a tussock tundra flat about four miles southwest of A225. It grew to about 500 acres in two hours, and was estimated to be 1,920 acres on July 4, when a general rain moved into the area and extinguished it. The fire was next observed on July 9 when it was declared out.

Fire Costs

Table 3 lists all fires by management option as classified by AFS. The final fire report incorrectly assigns the fire management option for five of these fires. Because suppression action was dictated by the fire management option assigned by AFS, these five fires are analyzed according to the option designated when attack action was initiated. Four of the fires were called Full Protection instead of Modified Action. One Limited Action fire, close to a boundary with a Modified Action area, was considered to be Modified, and was attacked. Resource Area staff noted that fire management options were incorrect for several fires while suppression action was still ongoing. These errors were corrected on situation and final fire reports, but may have influenced the degree of suppression action taken.

Full Protection Fires - Twenty-nine percent (20) of the 71 fires on BLM lands within the Resource Area ignited on lands designated as Full Protection (Table 3). Policy for this option is to control wildfires through immediate and aggressive action. Controlling all fires at the smallest possible acreage is the major suppression objective. These fires burned 1,136.1 acres for an average of 56.8 acres per fire. The fires were manned with 193 fire fighters; eight of the fires received a total of 49,250 gallons of retardant. Two fires received rain. The objective for this management option was achieved.

Total suppression costs amounted to \$298,578 for an average of \$14,929 per fire. Five fires (A174, A220, A278, A321, and A358) accounted for 76 percent of this total. Fire A174, the most expensive fire of the year (\$101,859), was located approximately 12 miles northeast of the village of Hughes. Twenty-seven smoke jumpers and 8,000 gallons of retardant were used during the first 2.5 hours of initial attack. A thunder cell then moved across the fire which caused it to burn out of control. Two organized crews were ordered as rain fell onto the fire, which was declared controlled 24 hours later. This fire burned 800 acres.

TABLE 3. SUPPRESSION DATA BY MANAGEMENT OPTION
BLM LAND: NORTHWEST RESOURCE AREA
1984 FIRE SEASON

MGMT. OPTION	FIRE NO.	PLANNING SUBUNIT	DETECTION SIZE	FINAL SIZE	DETECTION DATE	ATTACKED DATE	CONTROLLED DATE	OUT DATE	TOTAL FORCES	GALLONS RETARDANT	SUPPRESSION COSTS (\$4\$)
Full	A103	Hughes	0.0	0.1	6/17	6/17	6/18	6/19	2	0	3,718
	A168	Tozitna	0.0	1.0	6/20	6/21	6/21	6/23	7	0/RAIN	7,150
	A174	Hughes	40.0	800.0	6/21	6/21	6/22	6/24	59	8,000	101,859
	A220	W. Nulato	4.0	35.0	6/24	6/24	6/25	6/25	14	3,800	25,936
	A253	Imuruk	3.0	20.0	6/25	6/25	6/26	6/26	4	0	6,048
	A256	Squirrel	0.0	0.0	6/25	6/25	6/25	6/26	2	0	2,461
	A259	Squirrel	1.0	5.0	6/25	6/25	6/26	6/26	2	0	2,750
	A261	Squirrel	1.0	6.0	6/25	6/25	6/26	6/26	4	0	1,142
	A270	Tozitna	0.0	1.0	6/26	6/26	6/27	6/27	2	0	3,458
	A278	Kuskokwim	5.0	40.0	6/26	6/26	6/27	6/28	15	16,500	30,169
	A321	W. Nulato	1.0	10.0	6/28	6/28	6/28	6/29	8	6,950	27,469
	A322	W. Nulato	0.0	8.0	6/28	6/28	6/29	6/29	4	0	6,073
	A323	W. Nulato	0.0	12.0	6/28	6/28	6/29	6/29	4	3,000	8,198
	A358	E. Nulato	5.0	15.0	7/02	7/02	7/03	7/05	16	2,000	42,698
	A363	Dulbi-Kaiyuh	0.0	1.0	7/02	7/02	7/02	7/03	12	0	4,196
	A384	Bendeleben	30.0	120.0	7/02	7/02	7/03	7/03	10	0	4,730
	A398	Dulbi-Kaiyuh	0.2	35.0	7/03	7/03	7/04	7/04	13	7,500	11,845
	A415	Tozitna	0.5	1.0	7/03	7/03	7/04	7/04	3	0	3,246
	A419	Dulbi-Kaiyuh	0.5	1.0	7/04	7/04	7/04	7/05	8	1,500	3,267
	A453	Dulbi-Kaiyuh	15.0	25.0	9/24	9/24	9/28	9/28	4	0	3,165
Subtotal	20 Fires		106.2	1,136.1	--	--	--	--	193	49,250	298,578
Modified	A076	Hughes	5.0	7.0	6/09	6/09	6/10	6/10	8	2,000	16,421
	A112	Sheklukshuk	0.0	0.5	6/17	6/17	6/17	6/18	2	0	3,041
	A119	Hughes	1.0	1.0	6/18	6/18	6/18	6/19	4	0	5,672
	A121	Hughes	0.0	0.0	6/18	6/18	6/18	6/19	2	0	1,750
	A130	Hughes	3.0	4.0	6/18	6/18	6/19	6/19	7	0	6,699
	A195	Kuskokwim	3.0	4.0	6/23	6/23	6/24	6/24	13	0/RAIN	14,516
	A213	Sheklukshuk	1.0	4.0	6/24	6/24	6/25	6/25	2	0	2,844

Table 3 (continued)

MGMT. OPTION	FIRE NO.	PLANNING SUBUNIT	DETECTION SIZE	FINAL SIZE	DETECTION DATE	ATTACKED DATE	CONTROLLED DATE	OUT DATE	TOTAL FORCES	GALLONS RETARDANT	SUPPRESSION COSTS (B\$)
			0.0	1.4	6/24	6/24	6/25	6/25	4	0/RAIN	3,852
			3.0	3.0	6/24	6/24	6/24	6/25	4	0	2,025
			2.5	2.5	6/24	6/24	6/24	6/25	7	0	6,091
			0.0	0.0	6/25	6/25	6/25	6/25	0	0/RAIN	34,217
			5.0	400.0	6/25	6/25	6/25	6/25	24	8,000	34,217
			2.0	2.0	6/25	6/25	6/25	6/25	2	0	3,271
			4.0	12.0	6/25	6/25	6/25	6/26	11	0	76,526
			15.0	500.0	6/25	6/26	6/27	6/28	44	4,800	76,526
			0.0	0.1	6/26	6/26	6/26	6/26	6	0/RAIN	76,768
			0.5	1.0	6/26	6/26	6/27	6/28	7	0	7,078
			5.0	10.0	7/02	7/02	7/03	7/04	16	4,000	24,628
			5.0	5.0	7/02	7/02	7/04	7/05	13	4,000	25,551
			0.0	3.0	7/02	7/02	7/02	7/03	3	1,000	4,024
			0.0	2.0	7/02	7/03	7/03	7/03	4	0	1,938
			4.0	40.0	7/02	7/02	7/03	7/03	17	4,500	26,044
			100.0	1,000.0	7/02	7/02	7/04	7/05	52	6,000	68,424
			5.0	33.0	7/02	7/02	7/03	7/03	3	0	2,081
			1.0	1.0	7/03	--	7/03	7/04	0	0/RAIN	1,552
			165.0	2,036.5	--	--	--	--	255	34,300	340,309
			0.0	0.0	6/10	--	--	6/10	0	0/RAIN	292
			3.0	1,300.0	6/17	--	--	6/29	0	0/RAIN	1,967
			0.5	0.5	6/18	--	--	7/21	0	0/RAIN	96
			5.0	1,200.0	6/19	--	--	6/22	0	0/RAIN	2,089
			2.0	530.0	6/19	--	--	6/23	0	0/RAIN	638
			10.0	1,600.0	6/23	--	--	6/28	0	0/RAIN	838
			0.0	375.0	6/24	--	--	6/28	0	0	0
			2.0	10.0	6/24	--	--	6/25	0	0	128
			1.0	1.0	6/24	--	--	6/25	0	0	0
			5.0	800.0	6/24	--	--	6/29	0	0/RAIN	827
			0.0	2,560.0	6/24	--	--	7/09	0	0/RAIN	2,090
			8.0	8.0	6/25	--	--	7/12	0	0/RAIN	275
			2.0	4.0	6/26	--	--	7/12	0	0/RAIN	339
			165.0	2,036.5	--	--	--	--	255	34,300	340,309
			0.0	0.0	6/10	--	--	6/10	0	0/RAIN	292
			3.0	1,300.0	6/17	--	--	6/29	0	0/RAIN	1,967
			0.5	0.5	6/18	--	--	7/21	0	0/RAIN	96
			5.0	1,200.0	6/19	--	--	6/22	0	0/RAIN	2,089
			2.0	530.0	6/19	--	--	6/23	0	0/RAIN	638
			10.0	1,600.0	6/23	--	--	6/28	0	0/RAIN	838
			0.0	375.0	6/24	--	--	6/28	0	0	0
			2.0	10.0	6/24	--	--	6/25	0	0	128
			1.0	1.0	6/24	--	--	6/25	0	0	0
			5.0	800.0	6/24	--	--	6/29	0	0/RAIN	827
			0.0	2,560.0	6/24	--	--	7/09	0	0/RAIN	2,090
			8.0	8.0	6/25	--	--	7/12	0	0/RAIN	275
			2.0	4.0	6/26	--	--	7/12	0	0/RAIN	339

Table 3 (continued)

MGHT. OPTION	FIRE NO.	PLANNING SUBUNIT	DETECTION SIZE	FINAL SIZE	DETECTION DATE	ATTACKED DATE	CONTROLLED DATE	OUT DATE	TOTAL FORCES	GALLONS RETARDANT	SUPPRESSION COSTS (\$4\$)
	A274	Tozitna	0.0	0.0	6/26	--	--	6/27	0	0/RAIN	275
	A276	Tozitna	2.0	4.0	6/26	--	--	7/12	0	0	701
	A287	Tozitna	0.0	25.0	6/26	--	--	7/10	0	0	296
	A325	E. Nulato	4.0	5.0	6/28	--	--	7/02	0	0	0
	A380	Kuskokwim	0.0	0.5	7/02	--	--	7/08	0	0/RAIN	678
	A407	Dulbi-Kaiyuh	0.0	600.0	7/03	--	--	7/09	0	0	43
	A413	Sheklukshuk	5.0	1,990.0	7/03	--	--	7/09	0	0	280
	A414	Sheklukshuk	1.0	1.0	7/03	--	--	7/03	0	0	0
	A424	Kuskokwim	30.0	225.0	7/04	--	--	7/15	0	0/RAIN	972
	A434	Sheklukshuk	3.0	10.0	7/13	--	--	7/23	0	0/RAIN	691
	Subtotal	23 Fires	83.5	11,249.0	--	--	--	--	0	0	13,081
Unplanned	A371	Hughes	0.0	0.0	7/02	--	7/02	7/02	0	0/RAIN	190
	A209	E. Nulato	0.0	0.0	6/24	--	6/26	6/26	0	0/RAIN	385
	A210	E. Nulato	0.0	0.5	6/24	6/24	6/25	6/30	2	0/RAIN	6,842
	Subtotal	3 Fires	0.0	0.5	--	--	--	--	2	0/RAIN	7,417
Grand Total	71 Fires		354.7	14,422.1	--	--	--	--	450	83,550	659,385

Three fires (A357, A358, and A359) were detected about 15 to 20 miles southwest of the village of Kaltag, but their exact locations were unknown. Therefore, placement into the proper fire management option was difficult. AFS staff treated all three as Full Protection fires at the time of initial attack. NWRA staff, however, informed AFS that the coordinates placed two of the fires into Modified Action areas. The final fire statistics reported A357 and A359 as Modified Action fires and A358 as a Full Protection fire, which was the second most expensive Full Protection fire. Sixteen fire fighters and 2,000 gallons of retardant were used to attack fire A358 during the first three hours of suppression action. This 15 acre fire was declared controlled 21 hours after initial attack had begun. A total of \$42,698 was spent on A358.

Located approximately 30 miles southeast of the village of Tanana, fire A278 cost \$30,169 to suppress. Fifteen fire fighters, 16,500 gallons of retardant, and work with the helicopter's water bucket fought the fire during the first 5.5 hours of initial attack. The fire was controlled 8.5 hours after initial attack had begun; it burned 40 acres.

A321 (\$27,469) was a ten acre fire located approximately seven miles northeast of the village of Koyuk. Eight smoke jumpers and 6,950 gallons of retardant and water brought this fire under control in six hours.

A220 occurred about 20 miles northeast of Koyuk. Fourteen smoke jumpers and 3,800 gallons of retardant suppressed this fire 5.25 hours after first attack. It burned 35 acres and cost \$25,396.

Modified Action Fires - Twenty-five fires, 35% of the total, occurred in Modified Action areas. Policy for this option is to contain all wildfires using aggressive initial attack during the critical part of the fire season. Reducing suppression costs and providing opportunities for fire to achieve resource objectives are the fire plan's objective. These fires burned 2,036.5 acres for an average of 81.5 acres per fire. A total of 255 fire fighters were employed on 23 fires; 34,300 gallons of retardant were dropped on eight fires. Seven fires received rain, and two were rained out without being attacked. Because all fires were controlled within the first few burning periods, the suppression objectives were met.

\$340,309 was spent on the 25 Modified Action fires on BLM land in the Resource Area, an average of \$13,612 per fire. Six fires (A238, A252, A357, A359, A368, and A373) accounted for 75 percent of this total. Fire A252 was the most expensive Modified Action fire and second most expensive fire of the summer: \$76,526. It was located approximately 19 miles north of the village of Hughes. Because no forces were immediately available to fight this fire, it burned 400 acres in 15.7 hours prior to initial attack. Retardant arrived 1.5 hours after initial attack had begun and rain began falling a half-hour later. Two crews were employed as rain continued to fall. The fire was controlled 33 hours after initial attack had begun; it burned 500 acres.

Fire A373, located approximately 20 miles northeast of the village of Golovin, cost \$68,424 to suppress. Galena Zone dispatched three organized crews to this and two other adjacent fires. These two other fires were declared out upon arrival, so all three crews were assigned to fire A373. Fifty-two fire fighters and 6,000 gallons of retardant brought this fire under control about 38 hours after initial attack had begun. All daily "Situation Reports" reported this fire to have burned 100 acres, while actual size as recorded in the "Individual Fire Report" was 1,000 acres. The Resource Area did not know the fire's true size until the "Individual Fire Report" was reviewed in October.

A238 (\$34,215), was located approximately 14 miles southeast of the village of Kobuk. Five fire fighters attacked the fire, but a dry thunder cell approached which caused the fire to run. An organized crew plus 8,000 gallons of retardant and water helped fight the fire. The fire was controlled 21 hours after initial attack began and 400 acres were burned.

Fire A368 burned 40 acres about 11 miles southeast of Kobuk. Seventeen fire fighters and 4,500 gallons of retardant brought this fire under control 5.5 hours after initial attack had begun. Suppression costs were \$26,044.

A359 and A357, about 20 miles southwest of Kaltag, cost \$25,551 and \$24,628, respectively. Thirteen fire fighters and 4,000 gallons of retardant controlled A359 within 37 hours of attack. A357 required 16 people, 4,000 gallons of retardant, and about eight hours for control. Rain assisted suppression efforts on fire A359. A359 burned five acres and A357, ten acres.

Limited Action Fires - 23 fires (32%) were in Limited Action areas (Table 3). Policy for this option is to contain fires only to the extent required to prevent undesirable escape from the Limited Action area. Objectives are three-fold: (1) reduce overall suppression costs, (2) allow fires to burn unimpeded to their fullest extent possible, and (3) prevent fire activity from violating fire management policies and objectives in adjoining areas. These fires burned 11,249.0 acres for an average of 489.1 acres per fire. Neither fire fighters nor retardant were employed to extinguish the 23 fires, but rain did fall on 13 of these fires. Fires were declared out from one to 31 days after detection, although many of these fires were extinguished by rain before they were officially declared out. The management objectives were successfully met for Limited Action areas.

A discussion of costs for individual Limited Action fires will not be made. Monitoring of these fires was usually performed by detection aircraft. Varying numbers of fires were usually monitored by one flight, and flight costs were assigned to several of the fires. An accurate accounting of costs for individual limited fires is therefore not possible. The average fire costs of \$569 does give an estimate of the detection and monitoring costs for one fire. No detailed documentation of Limited Action fires is available from Galena or Tanana Zones, suggesting that monitoring procedures detailed in the Alaska Interagency Fire Management Plan were not followed.

Unplanned Fires - Three fires (A209, A210, and A371) were located on native selected lands that were unplanned. These fires burned one-half acre and

\$7,417 was spent for suppression. A210 was fought with two smokejumpers according to the Alaska Fire Attack Policy, and cost \$6,842. The other two fires were rained out and never attacked.

False Alarms - Fire project numbers were assigned to 13 false alarms. Total costs to investigate these amounted to \$4,928 for an average of \$379 per fire.

Cost Summary - Eighty-four fire project numbers were assigned of which 13 were false alarms. Seventy-one fires burned 14,422.1 acres for an average of 171.7 acres per fire. A total of 450 fire fighters on 44 fires and 83,550 gallons of retardant/water dropped on 16 fires were employed to extinguish the flames. Moreover, 25 fires received rain to assist the suppression effort. Total suppression costs amounted to \$664,313 for an average of \$7,908 per fire. The most expensive fire (A174) cost \$101,859, while the least expensive fires (A203, A208, A325, and A414) cost \$0.

It is difficult to make an accurate assessment of suppression cost savings due to fire plan implementation, because 1984 was the first year in which essentially all Resource Area lands were assigned fire management options. Twenty fires were attacked in Full Suppression areas, for an average cost of \$14,921. Twenty-five fires in Modified Action areas had an average expenditure of \$13,612. Detection and monitoring of 23 fires in Limited Action areas cost an average of \$569. Three fires in unplanned areas cost an average of \$2,472 each.

If the fire plan had not been in place, fires would have been suppressed according to the Alaska Fire Attack Policy, and received a level of suppression which ranged between that received under the Full and Modified options. Suppression forces were not overextended in the 1984 fire season, so it is likely that all fires would have been attacked. Because all Modified fires were controlled at small sizes, significant cost savings associated with modified suppression actions on large fires are not evident. Suppression costs expended in NWRA on the 49 Full, Modified, and unplanned fires totalled \$646,304, an average of \$13,465 per fire. When comparing that cost with the \$569 cost per fire in Limited Action areas, an average of \$12,896 was saved per fire. A total estimated savings of \$296,608 was made by not attacking any of the 23 Limited Action fires in the Northwest Resource Area in 1984.

A comparison of fires A174, a Full Protection fire, and A224, a Limited Action fire, explicitly demonstrates the cost savings. Both fires were located in Galena Zone, were approximately 130 miles from the Galena Zone Headquarters, and burned 800 acres each. However, A174 cost \$101,859, while A224 cost \$827.

Modified Conversion Dates

The evaluation dates for different Modified Action areas within the NWRA are July 1, 10, and 20. These dates allow for aggressive initial attack during the early critical portion of the fire season and increased resource benefits due to Limited Action status during the latter portion of the season. In most years, most fires are out by mid-July because of the normal appearance of July rains.

Of the 25 Modified Action fires, 17 started in June, seven started on July 2, and one started on July 3. Three fires started after the conversion date of July 1 in the Sheklukshuk subunit. One of these fires (A394) was rained out, but the other two (A364 and A368) were manned. The fire plan was not followed for these two fires, which were on native selected land. The July 1 conversion date was postponed to July 10 in the western Mulato Hills, southeast Kanuti National Wildlife Refuge, and southeast Koyukuk Refuge because of dry conditions. However, no fires started after July 1 in these areas. NWRA staff coordinated with Kanuti and Koyukuk Refuge staff to obtain the change in the conversion date.

Three different evaluation dates are difficult to track, especially during a fire-bust situation. The three different dates should be replaced by one date. During the 1984-85 winter, NWRA staff contacted Doyon, Ltd. staff regarding this and other problems. In a letter dated February 4, 1985, Doyon agreed to change the evaluation date to July 10 for their conveyed and selected lands. The July 10 date will also be uniformly applied to BLM lands within the NWRA.

Need for Accurate Fire Locations

Precise fire locations are necessary because the appropriate suppression action varies considerably among fire management options. Location affects the assignment of costs, because fire suppression is paid for by the Department of Interior on most Federal (except for U.S. Forest Service) and all Native lands in the State, while the State of Alaska pays for suppression action that they require on State lands. Correct fire locations are the basis for an accurate compilation of fire history, providing a basis for resource management. However, accurate fire locations were not always established by the AFS during the 1984 fire season.

The location of each fire is reported to the land manager as latitude-longitude coordinates and by township-range. Latitude-longitude coordinates are uniformly used because of aircraft navigation, but township-range is primarily used for the benefit of the land manager. The initial coordinates may be corrected several times before the fire is declared out. Problems occur when the corrected coordinates are not translated into corrected township-range, and when fire management option and land status are not confirmed for the corrected location. The wrong suppression action may be taken on the fire, or the wrong land manager may be notified. Suppression costs may be incorrectly assigned to the Department of the Interior or the State of Alaska. A precise location is also important when a fire is adjacent to a land status boundary. A201 began on the Nowitna National Wildlife Refuge, but burned onto BLM land. However, BLM was not notified and the U.S. Fish and Wildlife Service made all decisions regarding the fire. Also, there is no historical record that the fire affected BLM managed land.

Once located, fires should be accurately plotted on either 1:250,000 or 1:63,360 maps by detection or attack personnel. That an accurate location is sometimes not known is documented by the following examples. The coordinates for fire A274 match neither the township-range nor the map. The coordinates, township-range, and written description of fire A363 agree that the fire is on a ridgetop. The map, however, shows it to be in low wetlands. The map for A384 is simply the wrong inch:mile map for the reported location. A325 and

A204 are located on Kateel River B-5 and Candle D-1, respectively. However, the same section of a map is used to record the location for both fires, and it is not the correct map for either fire. Subsequent analysis, such as this report, is difficult to complete because of these kinds of errors.

Fire Plan Modification

Some of the boundaries between management options within the Tanana-Minchumina planning area followed township and section lines separating BLM and Doyon lands. The fire suppression organization prefers boundaries that follow natural barriers to fire spread, because fires cannot be stopped at straight line boundaries. Also, detection aircraft are more likely to assign fires to the correct management option if boundaries between options follow readily identifiable natural features. Consequently, NWRA staff met with Doyon staff during the 1984-85 winter to change the location of selected boundaries. Doyon agreed to these changes in a letter dated February 4, 1985. These changes were given to AFS for the 1985 fire season.

NWRA staff worked with representatives from the State Department of Natural Resources and Bering Land Bridge Preserve to modify fire management boundaries on the Seward Peninsula and in the western Nulato Hills. All villages in the Bering Straits region had been contacted during the winter and asked to request a fire management option for their lands. Only Unalakleet and Shishmaref replied. Lands from all other villages were redesignated as unplanned, rather than as Full Protection, and will receive suppression according to the Alaska Fire Attack Policy. State and Federal lands adjacent to these village lands were changed from Full to Modified with no conversion date. The areas of McCarthy's Marsh and the Kuzitrin River basin were placed in the Limited Action option.

It is recommended that NWRA staff work with Gana a'yoo Corporation and the Koyukuk Refuge to reduce the amount of land classified as Full Protection north of Galena and in the eastern Nulato Hills.

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Appendix A.

ALASKA INTERAGENCY FIRE MANAGEMENT PLAN FIRE MANAGEMENT OPTIONS

CRITICAL PROTECTION SITES (AREAS)

Policy

Policy: This designation is to identify sites (areas that are exposed to wildfire events that present a real and immediate threat to human life, inhabited property and designated physical developments. Wildfires determined as threatening such sites (areas) will be immediately and aggressively suppressed.

Objectives

- Protect human life and inhabited property.
- Place highest priority on the allocation of suppression forces to sites (areas) in this option.
- Limit damage from fire to the minimum achievable.

FULL PROTECTION AREAS

Policy

The fires burning in this area will be controlled through immediate and aggressive action.

Objectives

- Regardless of fire weather, or behavior, control all fires at the smallest acreage possible.
- Minimize the disruption by fire on designated, planned, or ongoing human activities in the area.

MODIFIED ACTION AREAS

Policy

Contain all fires using aggressive initial attack otherwise directed by the land manager/owner upon completion of a modified initial attack analysis.

Manage fires to consider resource management objectives in a cost-effective manner.

Objectives

- Reduce suppression costs on escaped fires through minimum force commitments and indirect suppression tactics.
- Provide opportunities for fire to help achieve land management objectives.

Appendix A. (Continued)

LIMITED ACTION AREAS

Policy

Contain fires only to the extent required to prevent undesirable escape from this area.

Objectives

- Reduce overall suppression costs.
 - Allow fire to burn unimpeded to the fullest extent possible.
- Prevent fire activity in this area from violating fire management policies and objectives in adjoining areas.

APPENDIX B. LOCATION OF 84 FIRE PROJECT NUMBERS
BLM LAND: NORTHWEST RESOURCE AREA
1984 FIRE SEASON

DATE	FIRE NO.	COORDINATES	RECTANGULAR NET	PLANNING SUBUNIT	AFS ZONE	MANAGEMENT OPTION ¹	ACTION TAKEN	ACRES BURNED	SIZE CLASS	SUPPRESSION COSTS (\$4\$)
5/21	A025	6535 15252	F T09N R26W S25	Tozitna	Tanana	Limited	False Alarm	0.0	-	259
6/09	A076	6600 15440	K T07N R20E S21	Hughes	Galena	Modified	Manned	7.0	B	16,421
6/10	A086	6608 15452	K T09M R19E S32	Hughes	Galena	Limited	Rain	0.0	A	292
6/17	A103	6626 15301	K T12N R27E S24	Hughes	Tanana	Full (Mod)	Manned	0.1	A	3,718
	A109	6625 15516	K T12N R17E S28	Hughes	Galena	Limited	Rain	1,300.0	F	1,967
	A112	6658 15622	K T18N R11E S13	Sheklukshuk	Galena	Modified	Manned	0.5	B	3,041
6/18	A119	6617 15426	K T10N R21E S08	Hughes	Galena	Modified	Manned	1.0	B	5,672
	A121	6647 15320	K T16N R25E S11	Hughes	Tanana	Modified	Manned	0.0	A	1,750
	A126	6652 15328	K T17N R25E S18	Hughes	Tanana	Limited	Rain	0.5	B	96
	A130	6614 15450	K T10N R19E S28	Hughes	Galena	Modified	Manned	4.0	B	6,669
6/19	A134	6538 15054	F T09N R16W S09	Tozitna	Tanana	Limited	Rain	1,200.0	F	2,089
	A153	6542 15228	F T09M R24N S13	Tozitna	Tanana	Limited	Rain	530.0	E	234
6/20	A168	6516 15048	F T05N R16W S15	Tozitna	Tanana	Full	Man/Rain	1.0	B	7,150
6/21	A174	6612 15403	K T09N R22E S12	Hughes	Galena	Full (Mod)	Man/Rain	800.0	E	101,859
6/22	A186	6453 14842	F T01N R06W S26	Nenana	State Prot.	Full	False Alarm	0.0	-	950
6/23	A195	6420 15247	F T07S R26W S06	Kuskokwim	Tanana	Modified	Man/Rain	4.0	B	14,516
	A201	6436 15248	F T04S R26W S14	Kuskokwim	Tanana	Limited	Rain	1,600.0 ²	F	808
6/24	A203	6555 15913	K T06W R03W S04	Buckland	Galena	Limited	None	375.0	O	0
	A204	6555 15913	K T06W R03W S14	Buckland	Galena	Limited	None	10.0	C	128
	A208	6625 15720	K T12N R07E S26	E. Nulato	Galena	Limited	None	1.0	B	0
	A209	6612 15715	K T09N R07E S13	E. Nulato	Galena	Unplanned	Rain	0.0	A	385
	A210	6610 15719	K T09N R08E S17	E. Nulato	Galena	Unplanned	Rain/Man	0.5	B	6,842
	A213	6705 15723	K T20N R07E S32	Sheklukshuk	Galena	Modified	Manned	4.0	B	2,844
	A215	6706 15724	K T20N R07E S29	Sheklukshuk	Galena	Modified	False Alarm	0.0	-	0
	A217	6618 15452	K T10N R19E S05	Hughes	Galena	Mod (Lim)	Man/Rain	1.4	B	3,852
	A219	6646 15323	K T16N R25E S24	Hughes	Tanana	Modified	Manned	3.0	B	2,625
	A220	6509 16045	K T04S R10W S08	H. Nulato	Galena	Full	Manned	35.0	C	25,936
	A224	6638 15642	K T14N R10E S15	Sheklukshuk	Galena	Limited	None	800.0	E	827
	A225	6638 15708	K T14N R08E S09	Sheklukshuk	Galena	Limited	Rain	2,560.0	F	2,090
	A232	6432 14829	F T04S R05W S26	Nenana	State Prot.	Modified	Manned	2.5	B	6,091

¹ As reported in the "Individual Fire Report". Option in parentheses indicates correct option as identified by NWRA staff.
² An additional 600 acres burned on the adjacent Nowitna National Wildlife Refuge; suppression cost is Pro Rated.

Appendix B (continued)

DATE	FIRE NO.	COORDINATES	RECTANGULAR NET	PLANNING SUBUNIT	AFS ZONE	MANAGEMENT OPTION	ACTION TAKEN	ACRES BURNED	SIZE CLASS	SUPPRESSION COSTS (\$4\$)	
6/25	A233	6559 15449	K T07N R19E S27	Hughes	Galena	Modified	Rain	0.0	A	367	
	A235	6537 15118	F T09N R18W S15	Tozitna	Tanana	Limited	False Alarm	0.0	-	202	
	A238	6647 15629	K T16N R11E S15	Sheklukshuk	Galena	Modified	Manned	400.0	O	34,215	
	A240	6647 15628	K T16N R11E S16	Sheklukshuk	Galena	Modified	Manned	2.0	B	331	
	A241	6537 15118	F T09N R18W S10	Tozitna	Tanana	Limited	Rain	8.0	B	275	
	A251	6621 15438	K T11N R20E S20	Hughes	Galena	Modified	Manned	12.0	C	3,271	
	A252	6619 15429	K T11N R21E S31	Hughes	Galena	Modified	Man/Rain	500.0	E	76,526	
	A253	6507 16557	K T04S R36W S25	Imuruk	Galena	Full	Manned	20.0	C	6,048	
	A256	6733 16304	K T25N R20W S25	Squirrel	Galena	Full	Manned	0.0	A	2,461	
	A259	6735 16304	K T25N R20W S12	Squirrel	Galena	Full	Manned	5.0	B	2,750	
	A261	6735 16304	K T25N R20W S12	Squirrel	Galena	Full	Manned	6.0	B	142	
	6/26	A269	6542 15206	F T10N R22W S14	Tozitna	Tanana	Limited	None	4.0	B	339
		A270	6517 15250	F T05N R22W S04	Tozitna	Tanana	Full	Manned	1.0	B	3,458
		A271	6545 15155	F T11N R21W S03	Tozitna	Tanana	Limited	False Alarm	0.0	-	0
		A274	6539 15233	F T10N R24W S34	Tozitna	Tanana	Limited	Rain	0.0	A	275
		A275	6551 15152	F T12N R21W S24	Tozitna	Tanana	Limited	False Alarm	0.0	-	0
A276		6541 15206	F T10N R22W S23	Tozitna	Tanana	Limited	None	4.0	B	701	
A278		6502 15106	F T02N R17W S06	Kuskokwim	Tanana	Full	Manned	40.0	C	30,169	
A287		6536 15228	F T09N R24W S24	Tozitna	Tanana	Limited	None	25.0	C	296	
A288		6550 15155	F T12N R21W S27	Tozitna	Tanana	Limited	False Alarm	0.0	-	0	
A290		6648 15653	K T16N R09E S02	Sheklukshuk	Galena	Modified	Man/Rain	0.1	A	768	
A295		6436 15033	F T04S R15W S03	Nenana	Tanana	Modified	Modified	1.0	B	7,078	
6/28		A321	6459 16058	K T06S R11W S07	W. Mulato	Galena	Full	Manned	10.0	C	27,469
	A322	6500 16032	K T06S R09W S05	W. Mulato	Galena	Full	Manned	8.0	B	6,073	
	A323	6500 16036	K T06S R10W S01	W. Mulato	Galena	Full	Manned	12.0	C	8,198	
	A325	6523 15822	K T01S R02E S24	E. Mulato	Galena	Limited	None	5.0	B	0	
	A327	6512 15159	F T04N R22W S02	Kuskokwim	Tanana	Critical	False Alarm	0.0	-	749	
	A349	6435 15023	F T04S R14W S09	E. Mulato	Galena	Full (Mod)	False Alarm	0.0	-	609	
	A357	6406 15914	K T16S R03W S15	E. Mulato	Galena	Modified	Manned	10.0	C	24,628	
7/02	A358	6407 15917	K T16S R03W S09	E. Mulato	Galena	Full (Mod)	Manned	15.0	C	42,698	
	A359	6406 15920	K T16S R03W S18	E. Mulato	Galena	Modified	Man/Rain	5.0	B	25,551	
	A363	6421 15736	K T13S R06E S24	Oulbi-Kaiyuh	Galena	Full (Mod)	Manned	1.0	B	4,196	
	A364	6646 15638	K T16N R10E S23	Sheklukshuk	Galena	Modified	Manned	3.0	B	4,024	
	A365	6648 15638	K T16N R10E S11	Sheklukshuk	Galena	Modified	False Alarm	0.0	-	0	

Appendix B (continued)

DATE	FIRE NO.	COORDINATES	RECTANGULAR NET	PLANNING SUBUNIT	AFS ZONE	MANAGEMENT OPTION	ACTION TAKEN	ACRES BURNED	SIZE CLASS	SUPPRESSION COSTS (\$4\$)
	A366	6409 16019	K T15S R08W S31	W. Nulato	Galena	Modified	Manned	2.0	B	1,938
	A368	6647 15638	K T16N R10E S23	Sheklukshuk	Galena	Modified	Manned	40.0	C	26,044
	A371	6621 15326	K T11N R25E S13	Hughes	Tanana	Unplanned	Rain	0.0	A	190
	A373	6457 16241	K T06S R20W S22	Bendeleben	Galena	Modified	Manned	1,000.0	F	68,424
	A380	6407 15347	K T16S R26E S08	Kuskokwim	Tanana	Limited	Rain	0.5	B	678
	A384	6456 16258	K T06S R21W S29	Bendeleben	Galena	Full	Manned	120.0	D	4,730
	A385	6456 16243	K T06S R20W S28	Bendeleben	Galena	Modified	Manned	33.0	C	2,081
	A389	6431 14823	F T05S R04W S05	Menana	State Prot.	Full	False Alarm	0.0	-	1,025
7/03	A394	6703 15633	K T19N R10E S24	Sheklukshuk	Galena	Modified	Rain	1.0	B	1,552
	A398	6440 15535	K T09S R16E S36	Dulbi-Kaiyuh	Galena	Full	Manned	35.0	C	11,845
	A407	6513 15452	K T03S R19E S24	Dulbi-Kaiyuh	Galena	Limited	None	600.0	E	43
	A413	6636 15714	K T14N R08E S19	Sheklukshuk	Galena	Limited	Rain	1,990.0	F	280
	A414	6641 15709	K T15N R08E S27	Sheklukshuk	Galena	Limited	None	1.0	B	0
	A415	6513 15140	F T05N R20W S33	Tozitna	Tanana	Full	Manned	1.0	B	3,246
7/04	A418	6516 15050	F T05N R16W S15	Tozitna	Tanana	Full	False Alarm	0.0	-	0
	A419	6426 15646	K T12S R10E S24	Dulbi-Kaiyuh	Galena	Full	Manned	1.0	B	3,267
7/13	A434	6637 15656	K T14N R09E S16	Sheklukshuk	Tanana	Limited	Rain	10.0	C	691
7/16	A440	6542 15330	K T03N R26E S05	Tozitna	Tanana	Limited	False Alarm	0.0	-	1,134
9/24	A453	6438 15619	K T10S R13E S08	Dulbi-Kaiyuh	Galena	Full	Manned	25.0	C	3,165

3 An additional 225 acres burned on the adjacent BLM Anchorage District; suppression cost is Pro Rated.

Form 1279-3
(June 1984)

BORROWER'S

JK JK
870 The 1984 Fire Season,
.13 BLM, Alaska.
06
no. 85/16
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